ARE Sensus®
Integrated Building Services System

Are Oy,
Esa Klemetti
Director

Business Structure

ARE Group

Building Services*	Maint-enance for Building Services	Industrial Contract-ing

* **HVAC, Electrical, Fire protection, Building automation & Security systems**

Structure

ONVEST Group *

The Onninen Group	**The ARE Group**	**Onninen-sijoitus Oy**	**Onvest Oy**
Technical Wholesale Shares: Onvest 100%	Building Services Contracting And Maintenance Shares: Onvest 100%	Investment Shares: Onvest 100%	Real estate business Shares: Onvest 100%

* **A family owned company, turnover in 2004: 1310 Me, personnel 4270**

Customers

International:

- International corporations
- Foreign and local construction groups
- Manufacturing and trading companies
- International property owners and developers
- Local property owners, investors
- Local, financially sound companies

In Finland:

- Property owners and investors
- Commerce
- Construction firms
- The Government
- Banks and finance companies
- Municipalities
- Industry
- Private companies,
- Facility users

Are Oy, Group key figures

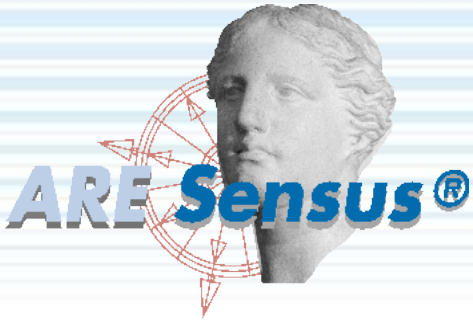
www.are.fi

	2000	2001	2002	**2003**	**2004**
Turnover (EUR million)	121	153	158	**131**	**162**
Invoicing (EUR million)	136	150	147	**145**	**167**
Operating profit (EUR million)	5,3	8,1	6,3	**2,7**	**0,6**
Orders in hand, Dec. 31 (EUR million)	86	80	66	**97**	**97**
Equity-to-assets ratio (%)(%)	26	32	41	**42**	**38**
Personnel, Dec. 31	1222	1292	1480	**1635**	**1525**
Offices	22	27	27	**29**	**32**

General Demands on Intelligent and Modern Buildings

- Good architecture and cost efficient solutions
- Flexible rooms spaces, lay out and space changes
- Better indoor conditions, healthy locations
- Good design and engineering, modern technology
- Quality targets provided
- Advantages for tenants and users
- Benefits to the real estate business (profit)
- Environmental aspects are within the solutions
- **Energy efficiency Life cycle costs**
- Life cycle assessment is part of the real estate business

--- to increase the human work and work space efficiency

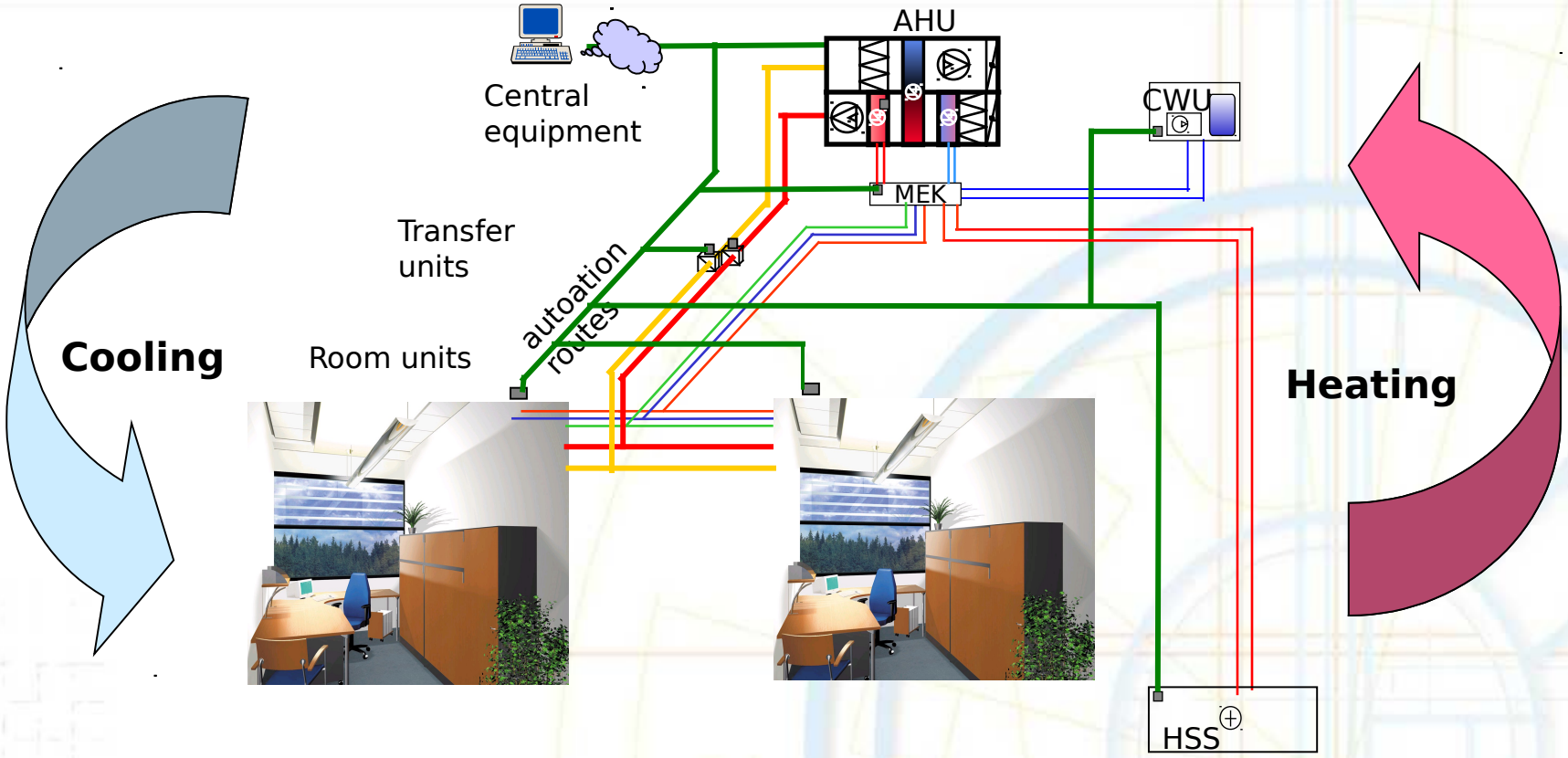


Demands for the

INTEGRATED BUILDING SERVICES

- **Room solutions,**
  - **Flexible for tenants & owners, good architecture**
- Systems solutions,
  - Modern technology
- Functional principles and energy management
  - System product
- Measuring and reports, proof the targets
- Objects, general solution versus, product

The principle of the integrated Building Services solution



ARE Sensus®

Sensus®

Building Services in the room space

Sensus panel
• for heating

Controlled indoor conditions

Non-glaring lighting

Low energy consumption

Excellent flexibility regarding room spaces and furnituring

ARE Sensus®

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ARE Sensus®

Building Services in the room space

Supply air
- **along the panel**
- **right air tempature**

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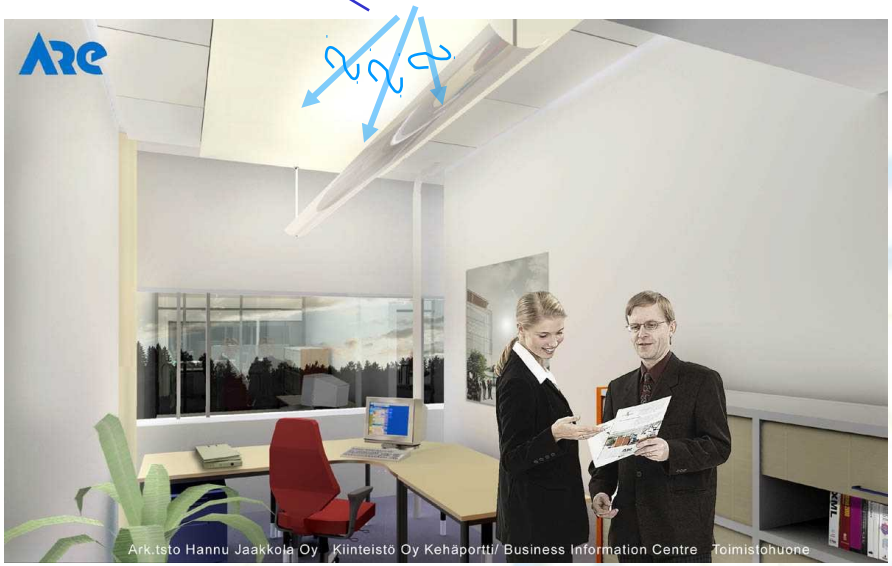
Controlled indoor conditions



Non-glaring lighting

Low energy consumption

Excellent flexibility regarding room spaces and furniturings

ARE Sensus®

Building Services in the room space

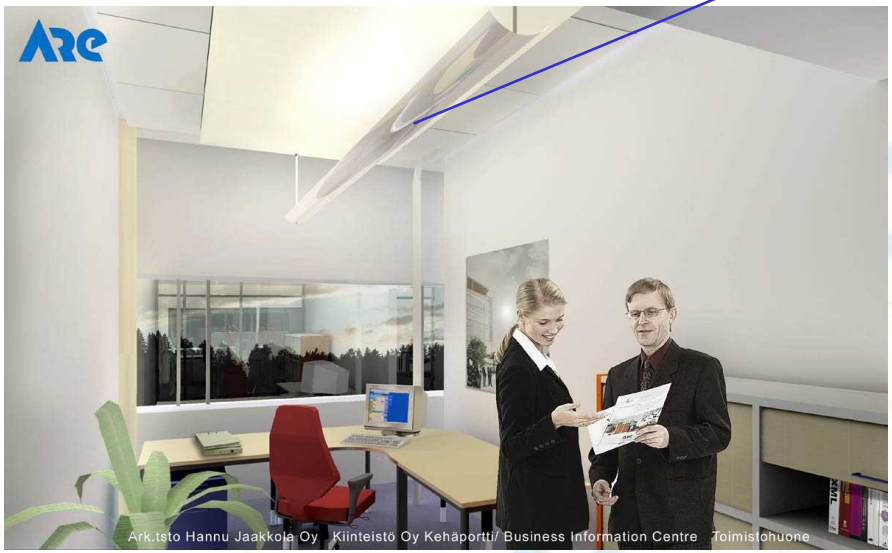
Supply air
- **along the panel**
- **right air tempature**

Sensus panel
- **for heating**
- **for cooling**

Sensus Line
- **indirect lighting**
- **via the panel surface**

Controlled indoor conditions

Non-glaring lighting



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Controlled indoor conditions

Non-glaring lighting

Individual regulation
- **heating and cooling are directed**

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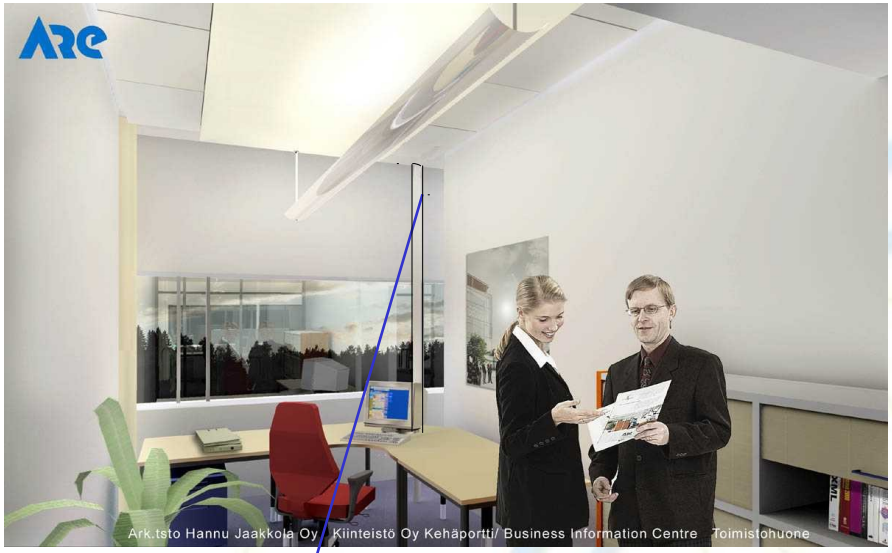

Individual regulation
- **heating and cooling are directed**

Low energy consumption

Excellent flexibility regarding room spaces and furniturings

Electrical distributions via the panels and poles

ARE Sensus®

Sensus® solution in the room space

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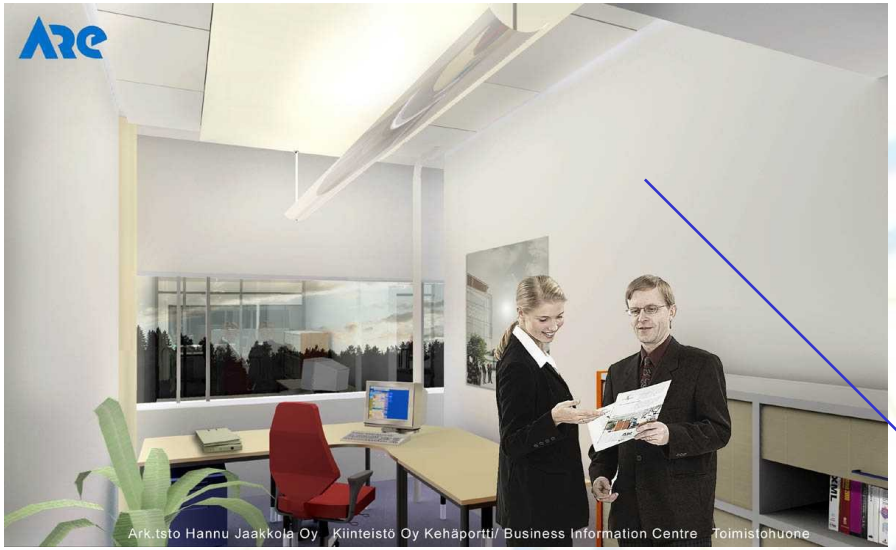


Individual regulation
- **heating and cooling are directed**

No installations in the external nor internal walls

Low energy consumption

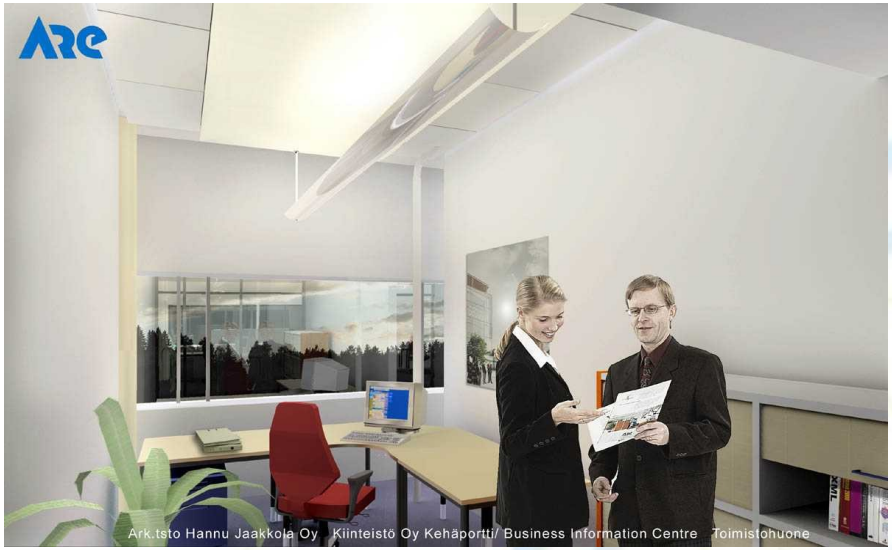
Excellent flexibility regarding room spaces and furnituring

Electrical distributions via the panels and poles

ARE Sensus®

Sensus® solution in the room space

Controlled indoor conditions



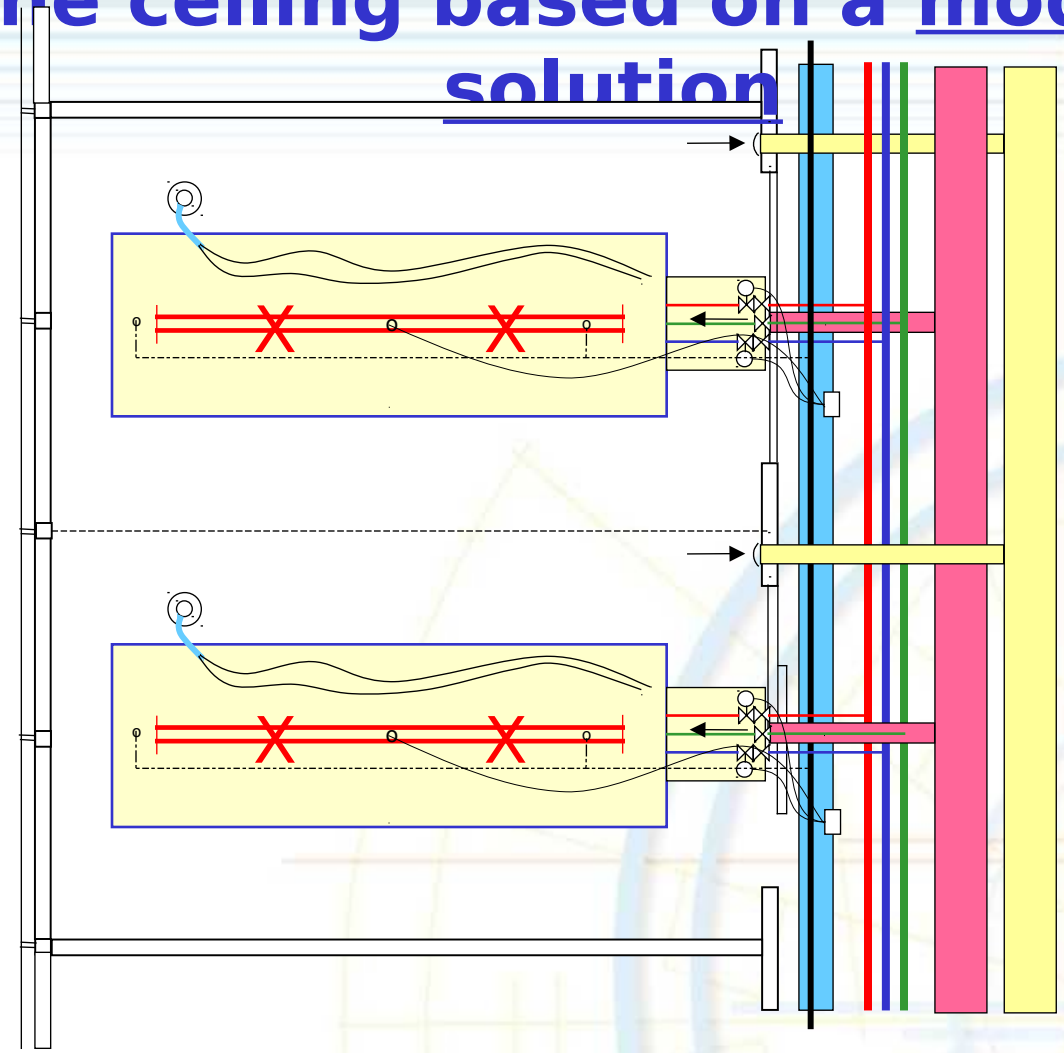
Non-glaring lighting

Low energy consumption

Excellent flexibility regarding room spaces and furnituring

ARE Sensus®

All technology can be located in the ceiling based on a modular solution



Flexibility from separate rooms…

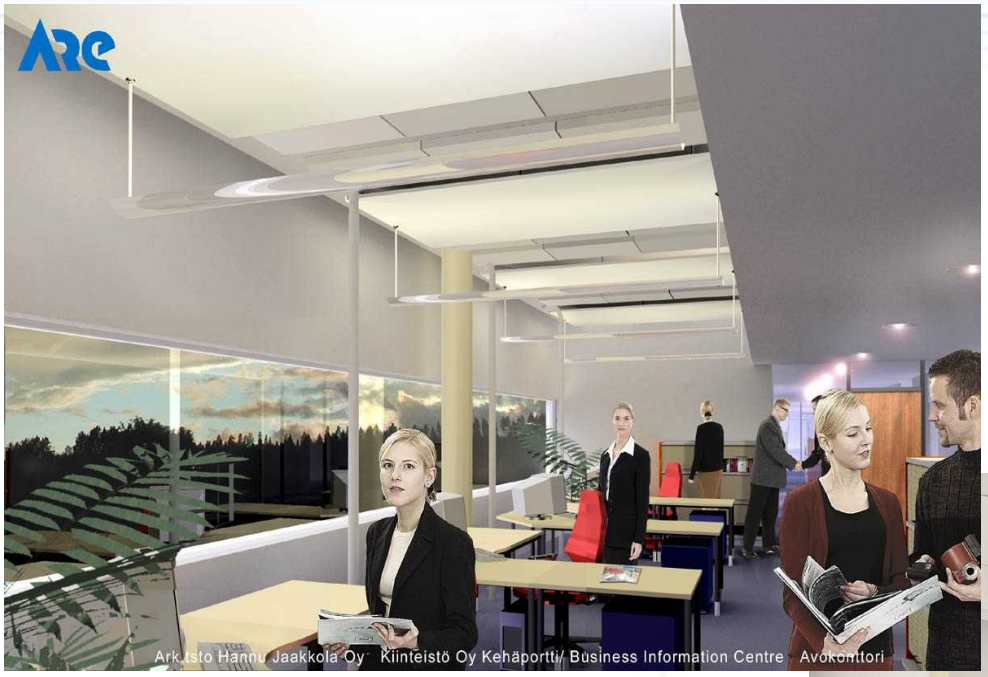
….to open area office…

… or to group rooms…

.. simple without technical revisions

ARE Sensus®

Alternative solutions can easily be modelled to show the Client different alternatives



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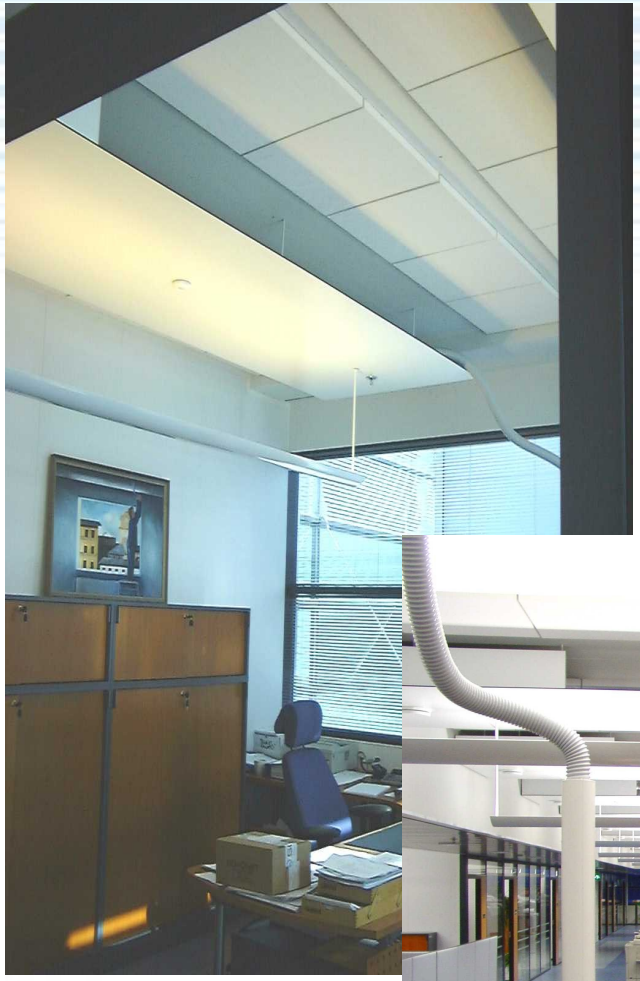
Building services technology leaves the working space free



ARE Sensus®

- Room solutions
- **Systems solutions**
  - ✓ **technology, product, energy savings**
- Functional princips and energy management
- Measurings and reports
- Objects

Traditional Building Services systems

- Heating
- Airconditioning
- Ventilation
- Lighting
- Automation
- Electrical distribution
- Low voltage systems

Separate systems

An integrated Building Services solution

- Heating
- Airconditioning
- Ventilation
- Lighting
- Automation
- Electrical distribution
- Low voltage systems

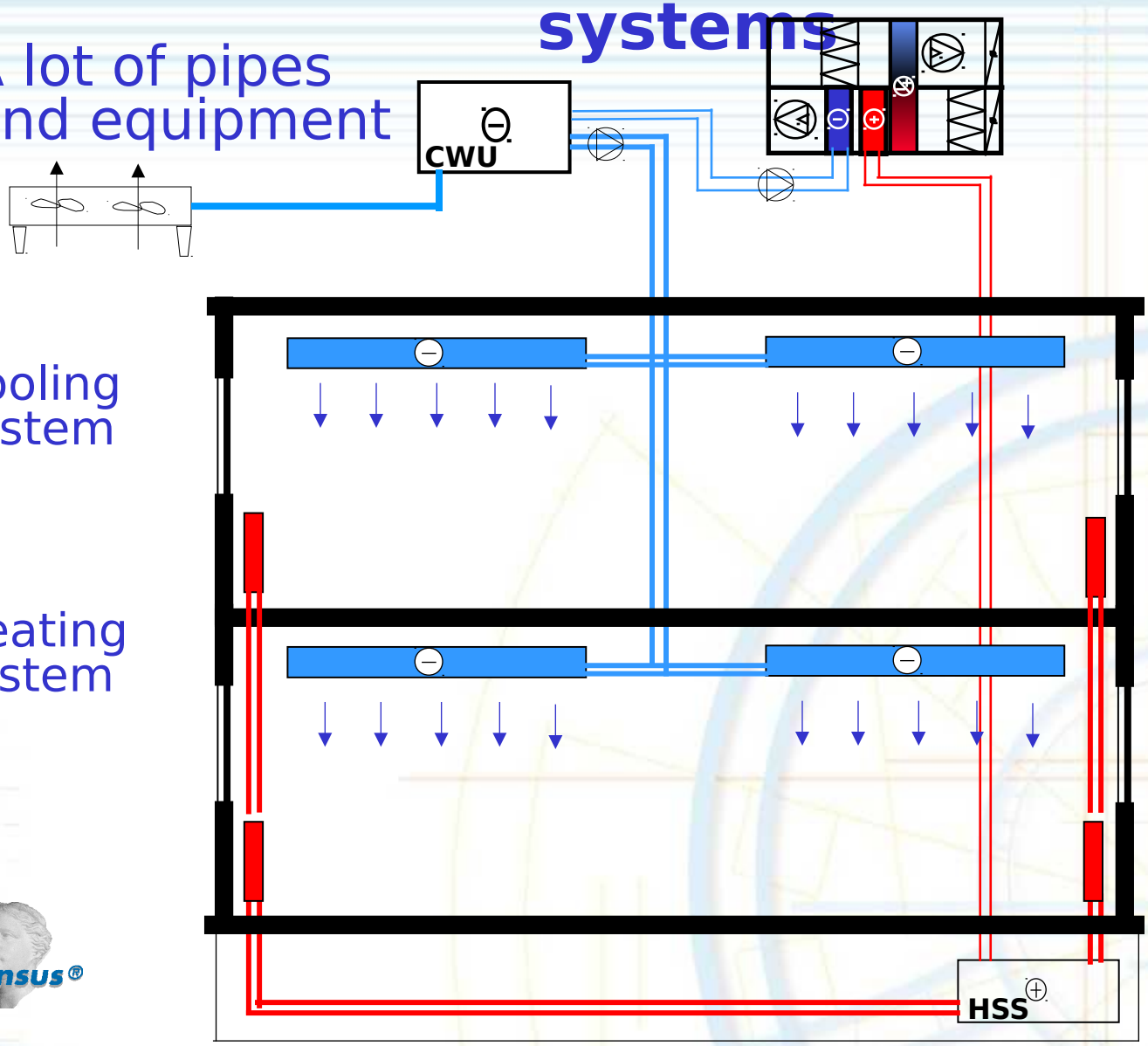
Sensus® **combines the functions into one total system**

Traditional Building Services systems

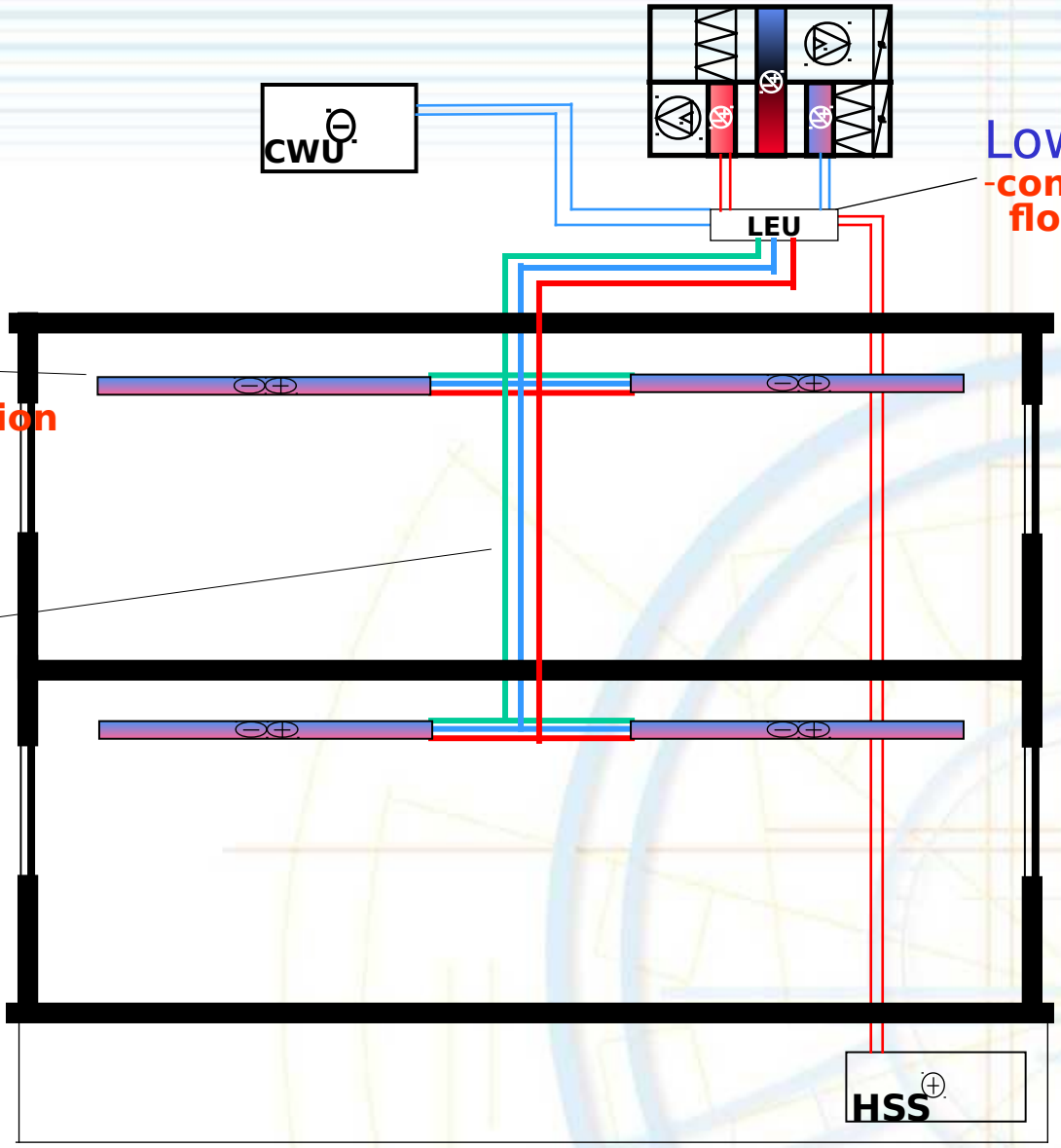
A lot of pipes and equipment

Cooling system

Heating system



Integrated *Sensus*® solution



Low energy unit
-controls the energy flows

Panels
-integrated function
-heating
-cooling

3-pipe system
-heating supply
-cooling supply
-combined return

- Room solutions
- Systems solutions
- **Functional princips and energy management**

  Controlled and reliable operation, cost efficient, energy saving solution

- Measurings and reports
- Objects

Sensus® is a low energy system

- It needs only lukewarm water for the heating
- It needs only cool water for cooling and air-conditioning

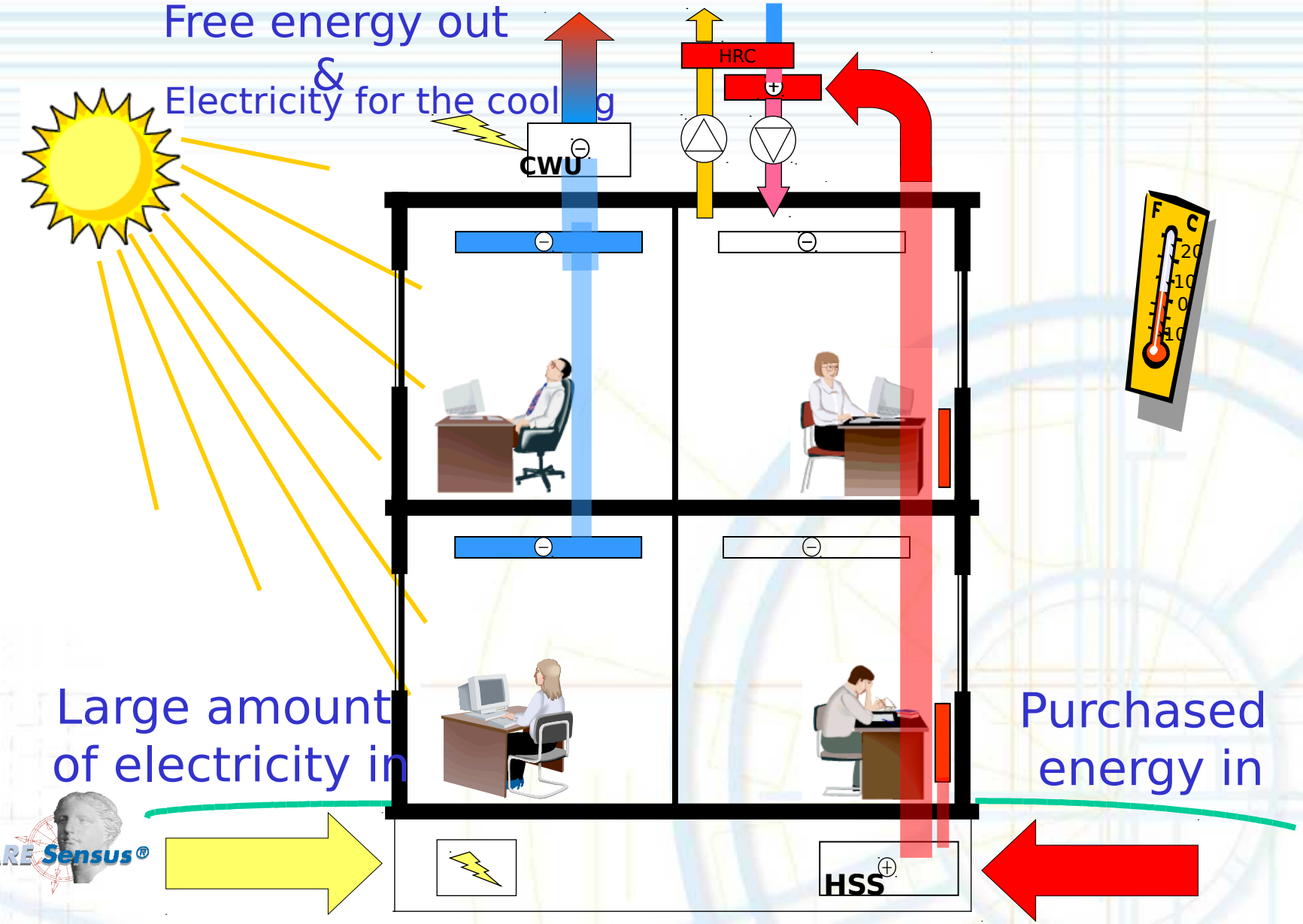
It uses only low valued energy

- Heating energy consumption is lower
- Cooling energy consumption is lower
- Energy consumption for lighting is lower

Total energy consumption is lower

ARE Sensus®

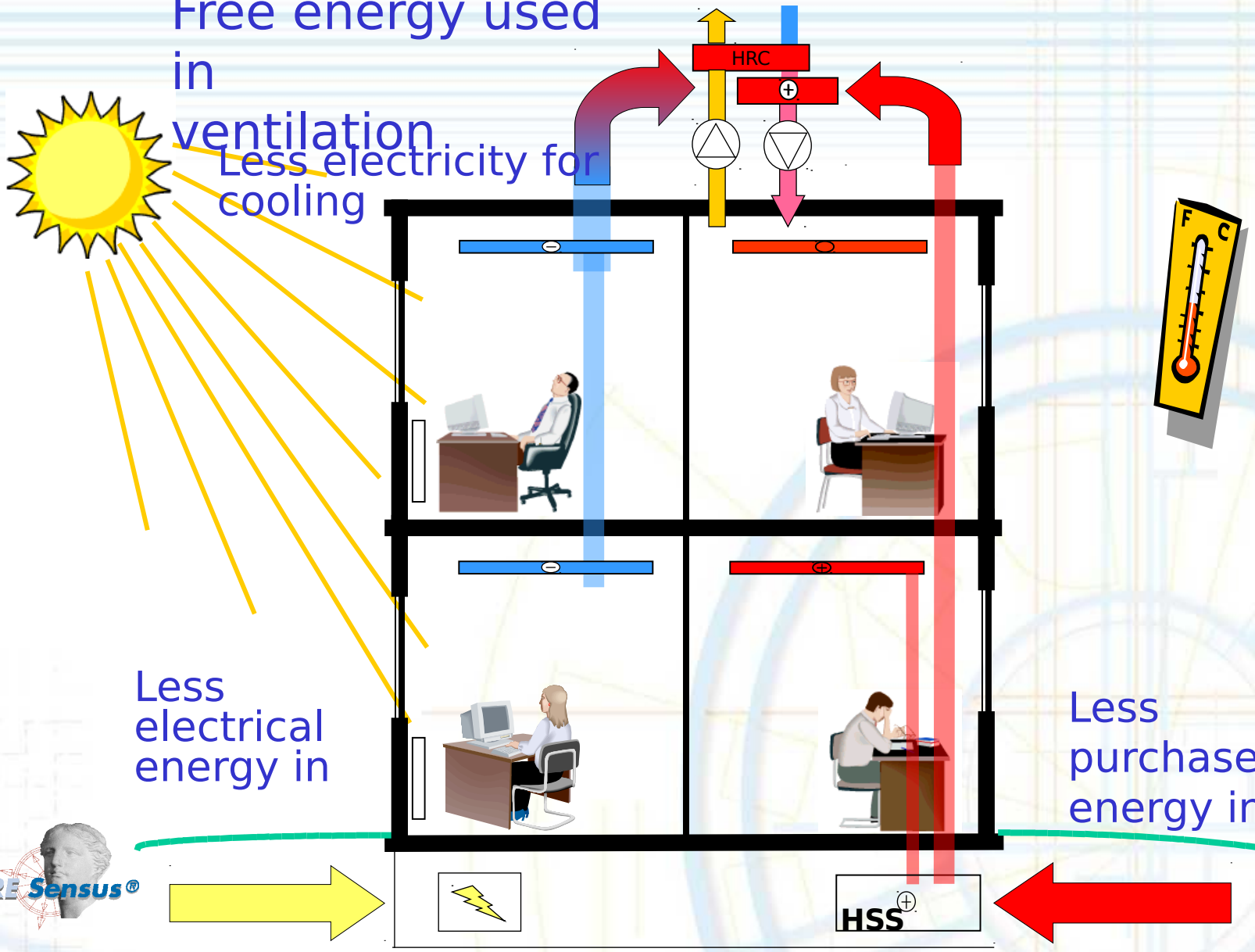
Traditional Building Service systems



Sensus ® Solution

Free energy used in ventilation

Less electricity for cooling

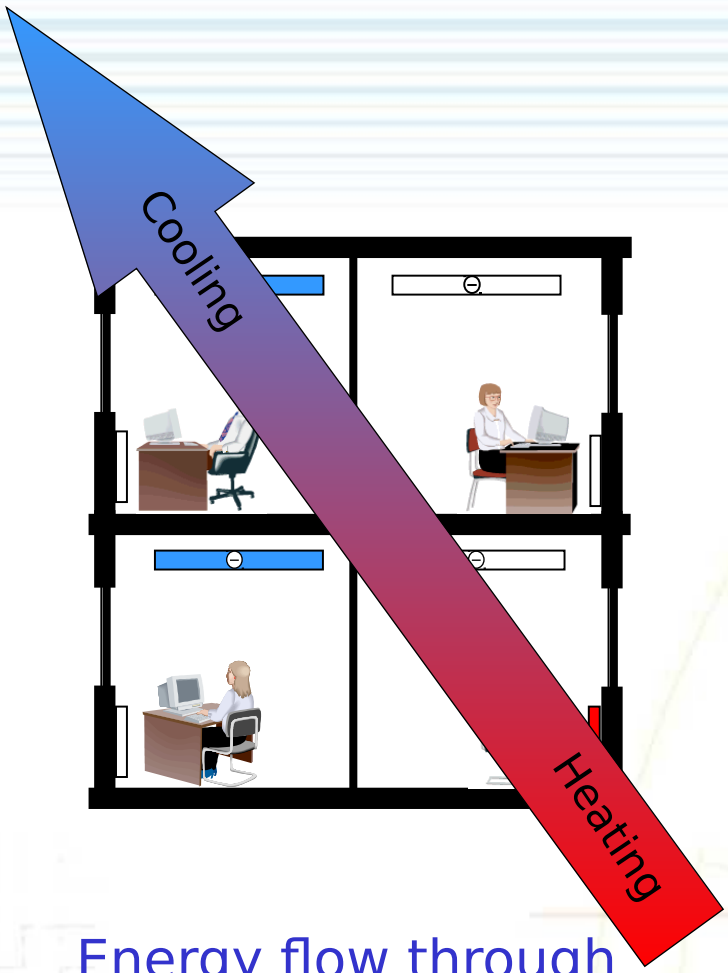


Less electrical energy in

Less purchased heat energy in

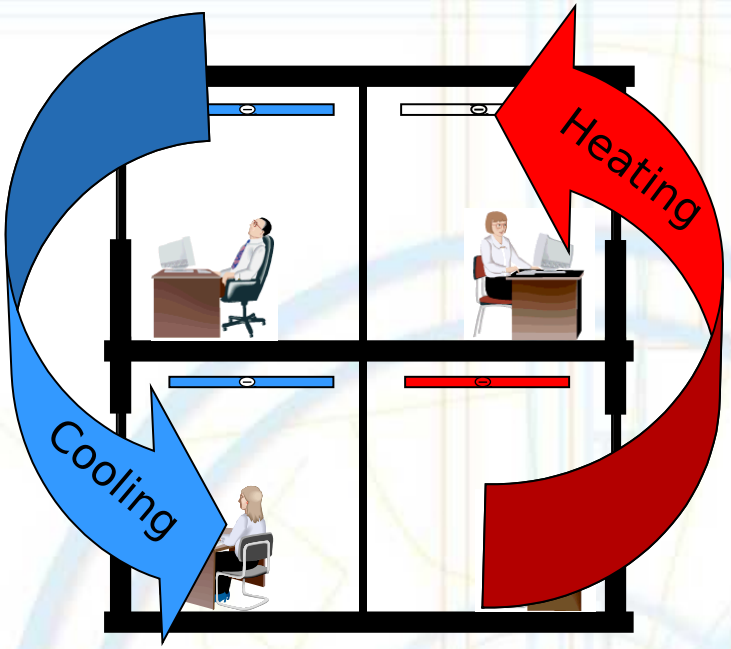
ARE Sensus®

Traditional



Energy flow through the building

Sensus®



Energy is circulated

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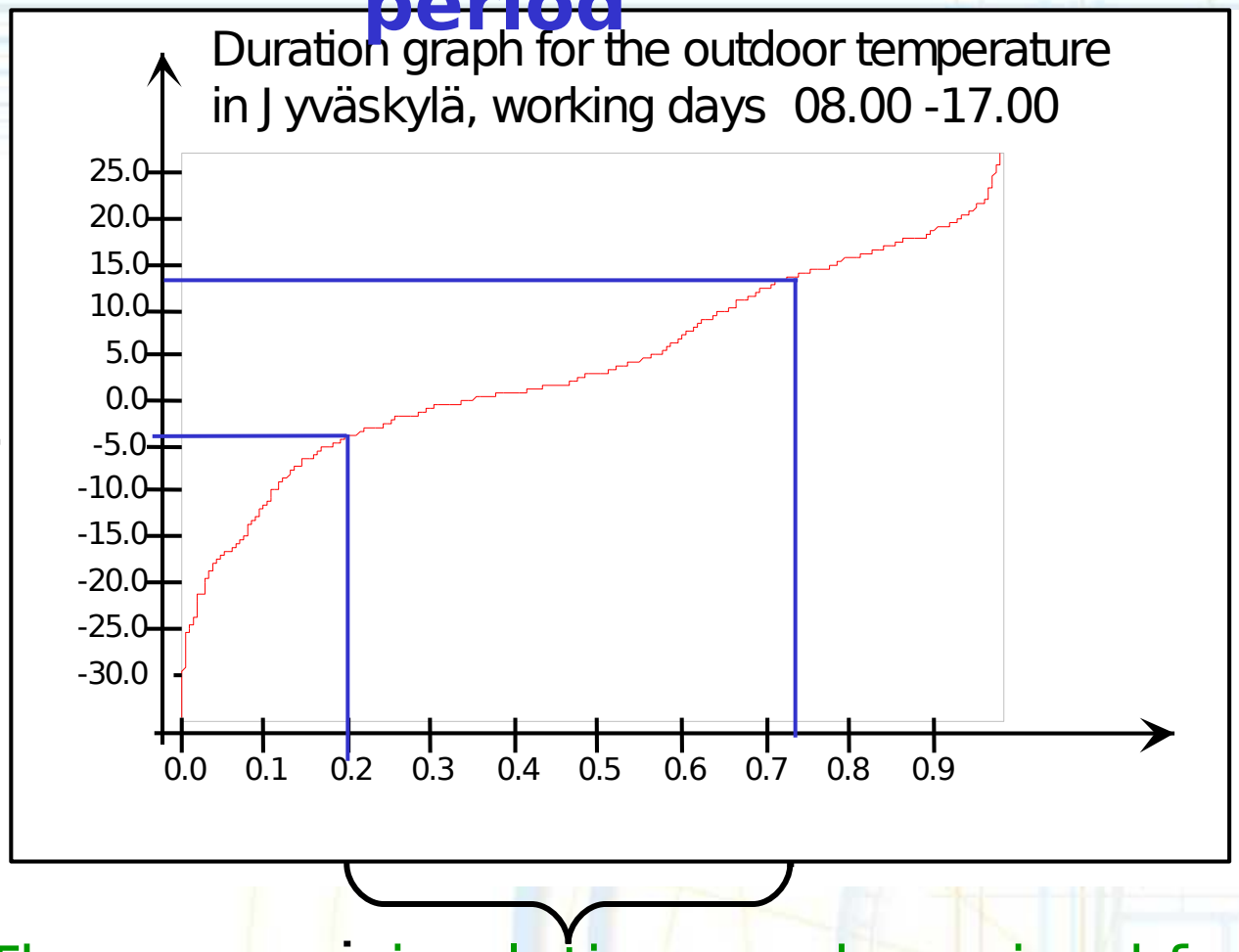
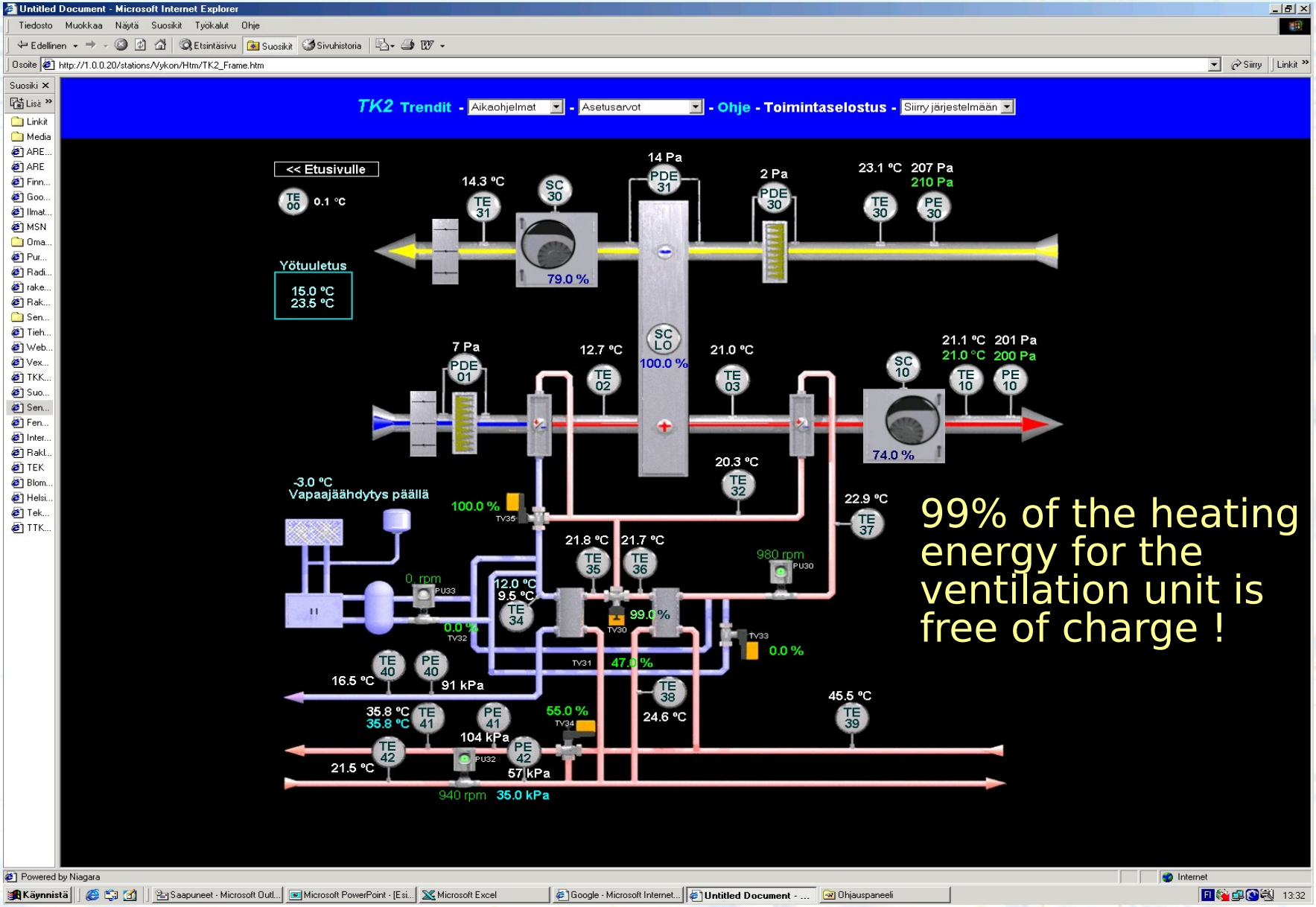
The energy is circulated during a long period

Situation when free energy can be used



The energy circulation can be gained for a period of more than half of the working time

Building Management System (BMS) by internet



- Room solutions
- Systems solutions
- Functional princips and energy management
- **Measurings and reports**
  - **Proving the targets**
- Objects

Target values for the indoor climate

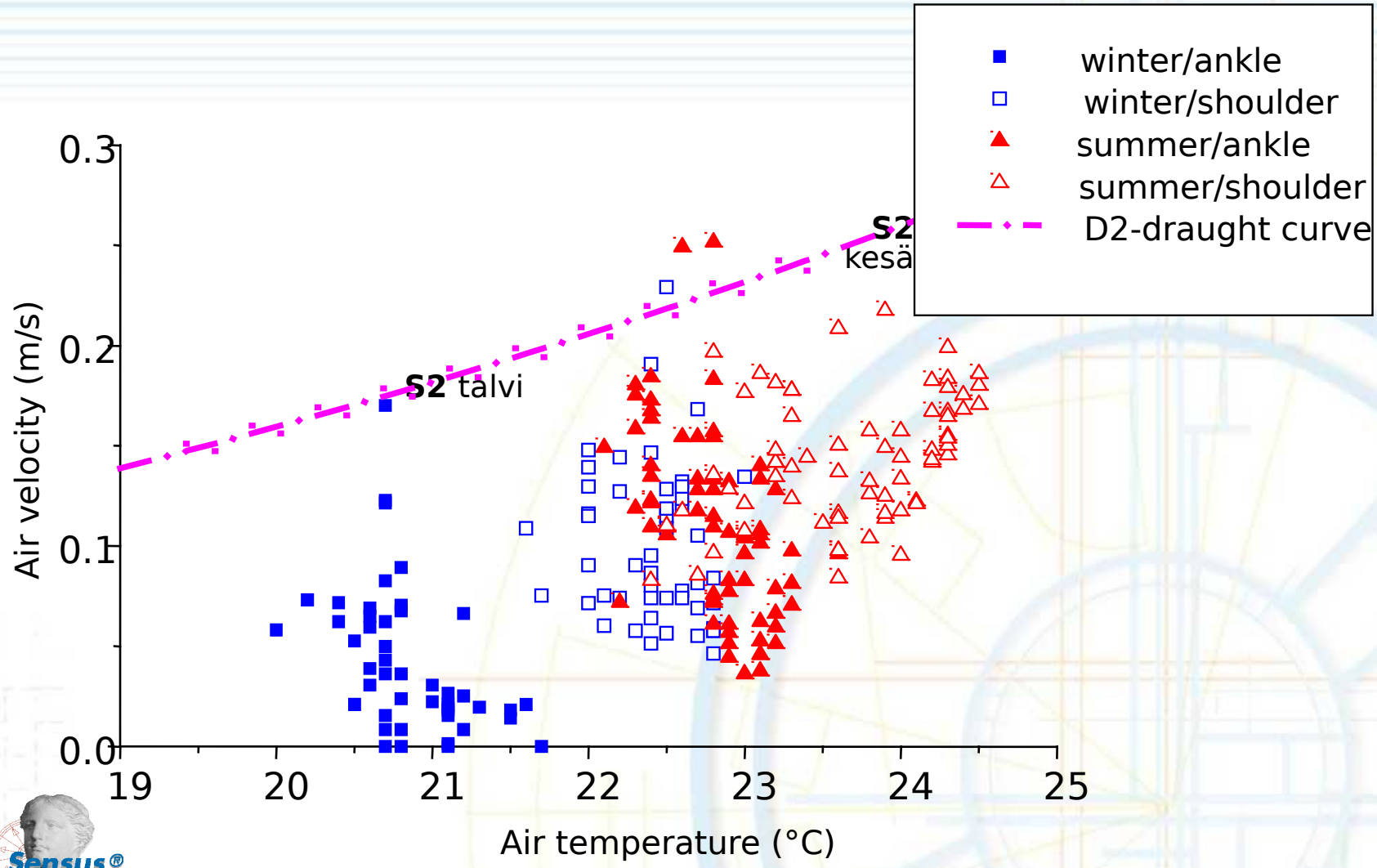
”Indoor climate classification 2000 in Finland”

Indoor climate, Class S2 (in Finland)

Room temperature	Winter	20-22 ºC	
	Summer	23-26 ºC	
Temperature difference		3 ºC	between ankle and shoulder
Floor temperature		19-29 ºC	surface
Air speed	Winter	0,17 m/s	air temperature 21 ºC
	Summer	0,25 m/s	air temperature 24 ºC

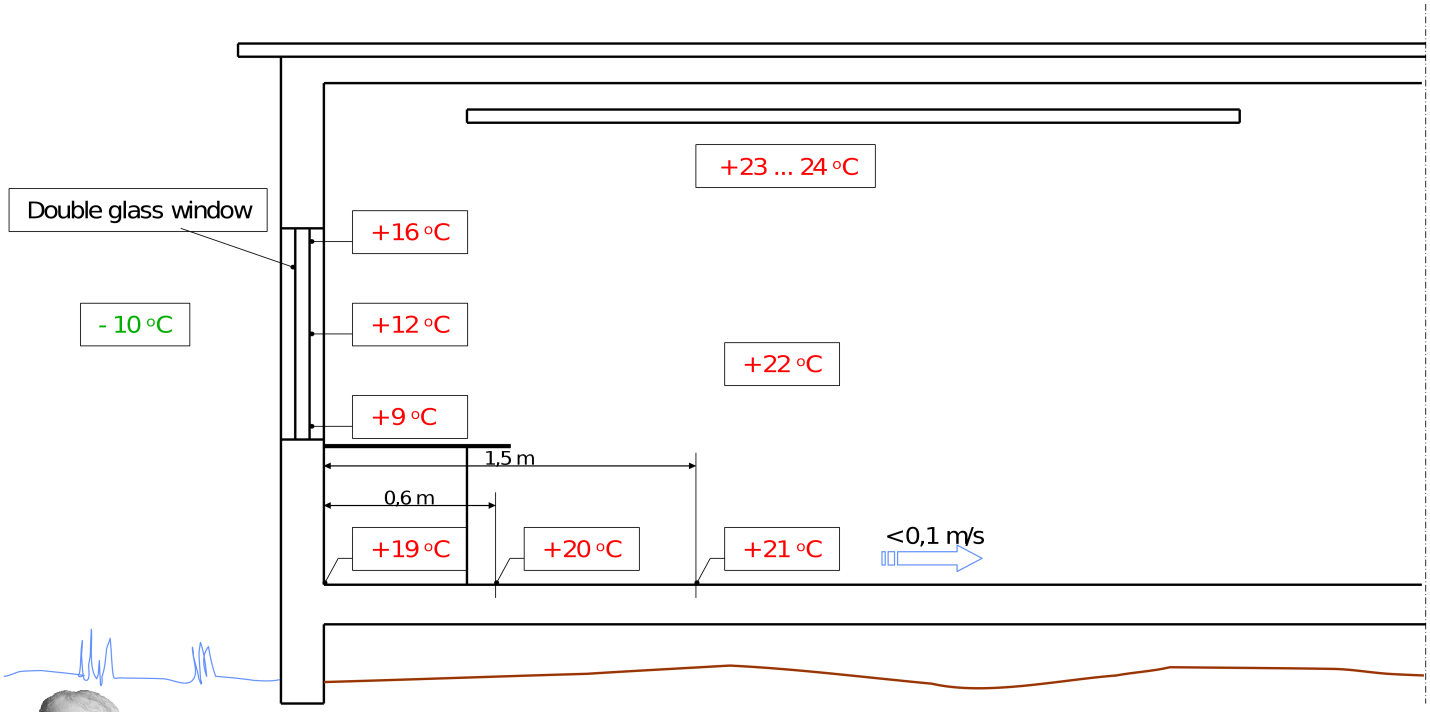
Measured Indoor climate

velocity and temperature, ”National Institute of Occupational Healt



Room temperatures in a Sensus office

Measurements by the "National Institute of Occupational Health"



Lighting conditions

Measurings by Helsinki Technical University's Lighting laboratory

	Measured Values	Requirements
Lighting intensity		
• reading area	612 lx	>500 lx
• average	535 lx	
• smallest value	419 lx	>150 lx
Luminance (brightness of the surface)		
• highest	890 cd/m²	<1000 cd/m²
• ratio	10:10:3	10:3:1 (object:near:distance)
Ratio of contrast reflection		
• reading area	0,98 %	>0,9 %
Power input		
• electrical input/area	10,2 W/m²	<15 W/m2 (recommendation

ARE Sensus®

- Room solutions
- Systems solutions
- Functional princips and energy management
- Measurings and reports
- **Objects**
  - ✓ **profiles, sustainable building**

Typical *high class –intelligent* objects

- Offices and Commercial buildings
- Educational buildings
- Hotels
- New and renovation objects

- The User is taking actively part in the decission process
- The Client/Investor is interested in an economical Life Cycle level
- Environmental questions are important values for the Client/Investor/User

Advantages of integrated building services

- **Controlled, draughtfree indoor conditions**
- **Glarefree lighting**

⇨ Pleasant, healthy and productive work environment

- **Excellent flexibility regarding the use of the floor area**
- **Free and independant disposal of furniture in the working area**
- **Integrated installations**

⇨ Spaces with high efficiency regarding usage and costs

- **Heating energy consumption 15 - 20% lower**
- **Electrical energy consumption 15 – 25% lower**
- **Flow of district heating water 12 - 15% lower**
- **Reduced environmental load**

⇨ Low Life Cycle costs

ARE Sensus®

By technology can be answered

to the requests of the future:

- indoor climate, energy consumption and environmental load become more and more important matters when technical solutions are selected

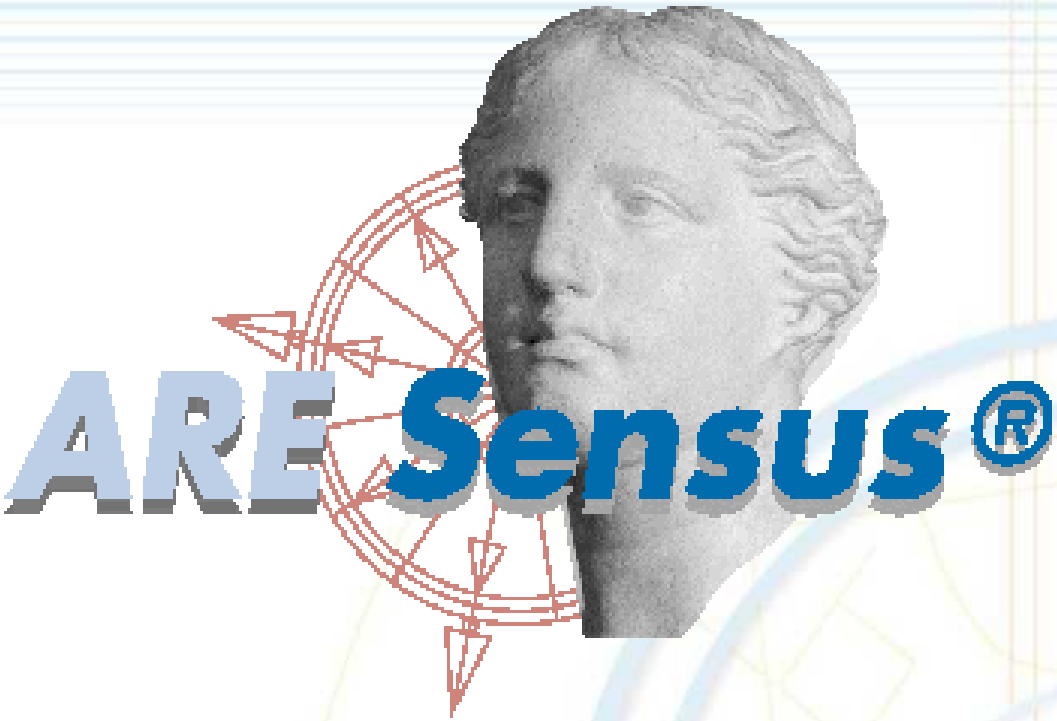
- intelligent and sofisticated systems require holistic solutions

- Owners and Users of real estate require and are ready to pay for practicality, comfortable & healthy climate

- holistic solutions where the Life Cycle costs are controlled and manageable are interesting for the investors

ARE Sensus References

Name of Object	Client	Year of completion	Br-m2
Technical Institute in Jyväskylä	Koul.kuntayht.kiint. l.	1998	3 000
Office buildings (1st stage) in Oulu	Elektrobit Oy	1998/1999/2000	2 980
Office Building in Jyväskylä	Real Est. company “Blomstedt”	2000	2 200
Area office for ARE Oy in Lahti	Onvest Oy	2000	400
Office Building “Sensus House” in Helsinki	Onvest Oy	2001	7500
Office buildings (2nd and 3rd stages) in Oulu	Elektrobit Oy	1999/2000	3 000
Head office for “Foster Wheeler” in Varkaus	Real Est company ”Eno”	2002	10000
IT-center “Dynamo” in Jyväskylän	Educational Facilities	2003	9000
Company Breeding Center in Vantaa	Vantaan Teollisuuskiinteistöt Oy	2004	3600
VR Rata office and storage building, Tampere	VR Rata Oy	2005	2500
Tehnopolis 2 office building, Tallinn	AS Eurox	2006	7500



.....is the future - already today